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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/650,166

08/27/2003

Jason Gratton

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EXAMINER

SUNG, GERALD LUTHER

ART UNIT

PAPER NUMBER

3746

MAIL DATE

DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/650,166	<b>Applicant(s)</b> GRATTON ET AL.	
	<b>Examiner</b> GERALD L. SUNG	<b>Art Unit</b> 3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 06 August 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) 23-28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>8/27/2003</u> .   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election with traverse of an ablative composite assembly, an ablative composite valve assembly, and a method of manufacturing in the reply filed on 9 July 2008 is acknowledged. The traversal is on the ground(s) that the restriction between the apparatuses is improper because the apparatuses claim all common elements. This argument is found to be persuasive and the restriction between the ablative composite assembly and the ablative composite valve assembly is withdrawn; however, the restriction between the ablative assemblies and the method of manufacture is deemed to be proper because all claims recite a time dependent limitation "when said film adhesive is cured." This limitation presents considerable weight in the claims presented regarding a method of manufacture but not in those regarding an apparatus. Furthermore, the arguments regarding the election of species are found to be persuasive and the election of species is withdrawn.

The requirement is still deemed proper and is therefore made FINAL.

2. Claims 23-28 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected method of manufacture, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 9 July 2008.

### ***Claim Objections***

3. Claims 16-21 are objected to because the independent claim 16 recites an ablative composite gas valve in the preamble and the dependent claims 17-21 recite a

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combination in the preamble. The Examiner objects to the inconsistency between the preambles in independent claim 16 and claims 17-21.

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 10-12 and 22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. Regarding claims 10 and 22, the limitation "unsupported" renders the claim indefinite because it is unclear what the term "unsupported" entails.

7. Regarding claims 11 and 12, the inclusion of trademarked products Scotch-Weld™ and Plastilock® render the claims indefinite.

8. Regarding claim 22, the limitation "In a hot gas valve a sub-combination assembly comprising..." renders the claim indefinite because it is unclear whether or not the limitations following the above limitation are being positively claimed. Is the claim only valid in a hot gas valve? Is the claim, claiming a hot gas valve?

***Claim Rejections - 35 USC § 102***

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

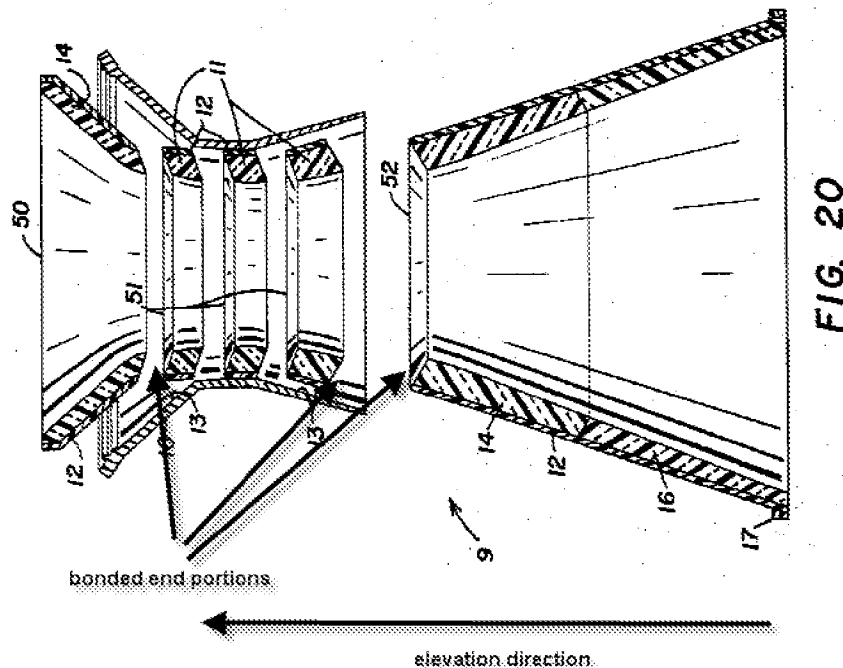
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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10. Claims 1-6 and 15-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Emerson USPN 3,418,707.

11. Regarding claims 1-3, Emerson teaches an integrated and match machined rocket nozzle and process of making the same comprising a rocket nozzle with ablative section assemblies 50, 51, and 52, and “fiberglass material 12 is wrapped around the ablative material of sections 50, 51, and 52 to provide strength and additional insulation for the shell 10. A bonding material (not shown) is applied as at 13 between the surfaces of the ablative material sections and of the shell 10 and serves as the means of attaching the ablative sections to the shell” (column 3 lines 63-69). The bonding component, herein interpreted as an adhesive film, being applied between the ablative sections 50, 51, and 52 is coupled to an end portion of the first or previous ablative section 50 and 51 and a portion of an opposite surface of the film adhesive is couple to an end portion of the second ablative sections 51 and 52. A shell 10 encloses the ablative sections 50, 51, and 52. With regards to the limitation “when said film adhesive is cured,” this limitation is regarded as a product by process limitation where the presence of an adhesive is determined to meet the limitations of the claim and little patentable weight will be given towards this limitation.

12. Regarding claim 4, the assemblies 50 and 51 all include an elevated end portion and are of substantially cylindrical shape. The adhesives being applied between the assemblies 50, 51, and 52 are coupled to the elevated end portion of the first cylindrical member.



13. Regarding claim 5, the assemblies 51 and 52 are substantially cylindrical in shape and are both diverging in nature. The diversion can be interpreted as a cylindrical protrusion located at the opposite end, with respect to the bond between the first and second assemblies. Furthermore, assembly 52 includes a reinforcement section 17 located at the opposite end of the bond between 51 and 52, where 17 is of substantially cylindrical shape.

14. Regarding claim 6, the adhesive which bonds the ablative assemblies serves in some capacity to seal the assemblies together.

15. Regarding claim 15, the ablative layer 16 is made of silica fabric tape impregnated with phenolic resin. This material is well known in the art to function in high temperature environments as an ablative shield.

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16. Regarding claim 16, referring to claim 1 above, the rocket nozzle is herein interpreted as being a gas valve. The broadest interpretation of a valve is a device that controls the flow of a gas or fluid through a pipe, where absent any structural limitations to the valve, the nozzle disclosed by Emerson is interpreted as reading on all elements. With regards to the limitation "when said film adhesive is cured," this limitation is regarded as a product by process limitation where the presence of an adhesive is determined to meet the limitations of the claim and little patentable weight will be given towards this limitation.

17. Regarding claim 17, referring to claim 2 above, Emerson discloses a rocket valve where the ablative assemblies are bonded together where the bonding substance is coupled to an end portion of the preceding assembly 50 and 51 and the end portion of the following ablative assembly 51 and 52.

***Claim Rejections - 35 USC § 103***

18. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

19. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

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4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
20. Claims 6-14 rejected under 35 U.S.C. 103(a) as being unpatentable over Emerson USPN 3,418,707 in view of Beggs et al. USPN 4,539,244.
21. Regarding claims 6-12, Emerson discloses all elements except for the use of an adhesive AF-31 manufactured by the 3-M Company.
22. Beggs et al. teach a honey comb noise attenuation structure which is assembled with the use of 3-M's AF-31, where "a thin porous fibrous material 20 is adhesively bonded to one surface of the perforate face sheet 14. The adhesive typically used to bond the various panel components is either AF-31 manufactured by the 3-M Company, metal bond 4021 manufactured by Narmco, FM-300 manufactured by Bloomingdale Aerospace products, or adhesive having the same of similar characteristics as the above list. These adhesives generally consist of a low solid solvent solution. When the solvents are removed from these solutions by evaporation the viscosity index is elevated" (Column 2 lines 64-68 and column 3 lines 1-6).
23. It should be noted that the adhesive AF-31 manufactured by the 3-M company is an unsupported, thermosetting, nitrile phenolic, structural film adhesive designed for metal-to-metal bonding in high temperature resistant applications. The glue is manufactured at 9-11 mils (uncured). Please refer to the attached 3M AF-31 technical data sheet for the above information. It should be noted that the technical data sheet is relied upon only as extrinsic evidence to show the manufacturer's existing specifications for the adhesive AF-31, the use of AF-31 is taught by Beggs et al.



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24. One of ordinary skill in the art at the time of the invention would have found it obvious to include the use of the adhesive AF-31 manufactured by the 3-M Company for use as the bonding substance which is not discussed in Emerson to provide proper bonding of ablative assemblies 50, 51, and 52 in the severe environments typically found in airborne vehicles while providing proper structural integrity.

25. Regarding claims 13-14, Emerson, as previously modified by Beggs et al., teaches the use of the film adhesive AF-31, where the presence of the glue as taught by Beggs et al. is read to meet the limitations of claims 13-14. These limitations are interpreted as being product by process limitations where the presence of the film adhesive AF-31 is regarded as meeting the claimed limitations.

26. Claims 18-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Emerson USPN 3,418,707 in view of Stockel et al. USPN 3,595,025.

27. Regarding claims 18-21, Emerson discloses a thermally ablative rocket nozzle with a first substantially cylindrical member 50, 51 having an enlarged opening for hot gas flow through said first cylindrical member, the first cylindrical member has an elevated end portion and a portion of a surface of the elevated end portions is coupled with a film adhesive. Emerson also discloses a protrusion 17 located at the aft most end of the nozzle which encompasses the large hole through which hot gas flows. Emerson does not disclose a plurality of openings through the cylindrical member.

28. Stockel et al. teach the use of cooling channels 2 running longitudinally through the body of the rocket engine, including the nozzle. These holes run through the rocket nozzle's entirety and line up at all points. Both Emerson and Stockel et al. disclose a

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vertical wall, where Stockel et al. teach the include of cooling channels, herein interpreted as radial openings. The inclusion of the cooling channels taught by Stockel et al. into the nozzle disclosed by Emerson would have yielded a plurality of holes in both the second and first ablative assemblies, where the cooling channels as taught by Stockel et al. would have lined up so that the cooling channels/holes would have run the entire length of the nozzle.

29. One of ordinary skill in the art at the time of the invention would have found it obvious to include cooling channels as taught by Stockel et al. in the thermally ablative nozzle disclosed by Emerson in order to provide a means of cooling the nozzle in order to prevent structural damage due to thermal loads.

30. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Emerson USPN 3,418,707 in view of Beggs et al. USPN 4,539,244 and Stockel et al. USPN 3,595,025.

31. Regarding claim 22, referring to claims 1, 16 and 18-21 above, Emerson discloses a rocket nozzle formed from ablative subassemblies which are bonded together via an adhesive, Such that the subassemblies are cylindrical in shape and form a large hole so that hot gas may flow through it. the subassemblies have elevated end portions where the adhesive is applied to connect the assemblies and a housing which supports the entire nozzle assembly. With regards to the limitation "when said film adhesive is cured," this limitation is regarded as a product by process limitation where the presence of an adhesive is determined to meet the limitations of the claim and little patentable weight will be given towards this limitation.

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32. Beggs et al. is relied upon to teach the use of AF-31 adhesive to bond the ablative assemblies together.

33. Stockel et al. are relied upon to teach the use of longitudinally running cooling channels through the entire nozzle, herein interpreted as a plurality of holes running through the assemblies, and the use of a steel casing to house the rocket nozzle.

34. One of ordinary skill in the art at the time of the invention would have found it obvious to include to the rocket nozzle disclosed by Emerson, the use of the adhesive AF-31 to provide proper bonding of ablative assemblies 50, 51, and 52 in the severe environments typically found in airborne vehicles while providing proper structural integrity and the cooling channels 2 and steel housing taught by Stockel et al. in order to provide adequate cooling to prevent thermal damage to the nozzle and a material with the capability of handling the temperatures and pressures exerted by the rocket nozzle.

### ***Conclusion***

35. Any inquiry concerning this communication or earlier communications from the examiner should be directed to GERALD L. SUNG whose telephone number is (571)270-3765. The examiner can normally be reached on M-F 9am-5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on (571) 272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Devon C Kramer/  
Supervisory Patent Examiner, Art  
Unit 3746

Gerald Sung  
Patent Examiner  
GS  
30 September 2008